AF/2613 JJW

**IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

Appl. No.	:	09/855,115
Applicants	:	Octavius H. MORRIS et al.
Filed	:	14 May 2001
TC/A.U.	:	2613
Examiner	:	Behrooz M. SENFI
Atty. Docket	:	GB-000068

Title: VIDEO SIGNAL ENCODING AND BUFFER MANAGEMENT

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop **Appeal Brief - Patents**
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

In response to the FINAL Office Action dated 26 January 2005, finally rejecting pending claims 1-14, and in support of the Notice of Appeal filed on 25 May 2005, Applicants hereby submit this Appeal Brief.

Real Parties in Interest

Koninklijle Philips Electronics N.V. owns all of the rights in the above-identified U.S. patent application by virtual of an assignment recorded at Reel 012196, Frame 0166.

Related Appeals and Interferences

There are no other appeals or interferences related to this application or to any related application, nor will the disposition of this case affect, or be affected by, any other application directly or indirectly.

Status of Claims

Claims 1-14 are all pending and all stand rejected.

Accordingly, the claims on Appeal are claims 1-14.

Status of Amendments

There are no pending amendments with respect to this application.

Summary of Claimed Subject Matter

The present invention is directed to a digital video image signal encoder apparatus and a method of encoding a digital video image signal in an encoder apparatus.

Accordingly, the invention, as broadly recited in claim 1, comprises a method for encoding of a digital video image signal in an encoder apparatus having a coding stage and an encoder buffer (page 2, lines 5-7). The method comprises: successively encoding image fields of the signal in compliance with a predetermined coding scheme (page 2, lines 8-9); reading the encoded field data into the buffer; and subsequently reading the stored data out of the buffer at a bit rate determined at least partially by the fullness of the buffer (page 2, lines 10-12); wherein each image field is encoded as a series of slices (page 2, lines 13, 18; page 12, lines 23-24) each comprised of a predetermined number of successive lines of the field (page 2, lines 13-14, 18-19; page 6, lines 30-32), with a predetermined number of data bits allocated for the encoding of a slice (page 2, lines 14-15, 27-31; page 10, lines 17-18; page 12, lines 35-27), and the encoded data for the slice is read into the encoder buffer and subsequently read out therefrom on completion of encoding of the slice (page 2, lines 15-17; page 10, lines 18-20; page 7, lines 3-7; page 9, lines 10-13).

As broadly recited in claim 2, the invention further features the slices of a field being encoded such that the encoded field complies with one or more MPEG standards (page 2, lines 23-24; page 4, lines 28-29; page 12, lines 24-25).

As broadly recited in claim 3, the invention further features the slices of a field being intra-coded without reference to any other field (page 2, lines 24-26; page 5, lines 1-2).

As broadly recited in claim 4, the invention further features the coding stage being operable to encode a slice at a number of quantisation levels, and the quantisation level used being chosen in dependence on the said predetermined number of bits allocated (page 2, lines 27-31).

As broadly recited in claim 5, the invention further features each slice comprising sixteen luminance lines (page 2, lines 18-19; page 6, lines 30-31).

As broadly recited in claim 6, the invention comprises an encoding stage arranged to receive successive image fields of the signal and encode them according to a predetermined coding scheme (page 3, lines 5-6); and a buffer coupled to receive encoded field data from the encoding stage and arranged to subsequently output the stored data at a bit rate determined at least partially by the fullness of the buffer (page 3, lines 7-9); wherein the encoding stage is further arranged to encode each image field as a series of slices (page 3, lines 10-11; page 12, lines 23-24) each comprised of a predetermined number of successive lines of the field (page 3, lines 11-12; page 6, lines 30-32) and within a predetermined number of data bits allocated for the encoding of a slice (page 3, lines 12-13; page 10, lines 17-18; page 12, lines 35-27), and the buffer is arranged such that the encoded data for the slice is read in thereto and subsequently read out therefrom on completion of encoding of the slice (page 3, lines 13-15; page 10, lines 18-20; page 7, lines 3-7; page 9, lines 10-13).

As broadly recited in claim 7, the invention further features the encoding stage being arranged to encode the slices of a field such that the encoded field complies with one or more MPEG standards (page 3, lines 16-18; page 4, lines 28-29; page 12, lines 24-25).

As broadly recited in claim 8, the invention further features the encoding stage being arranged to intra-code the slices of a field without reference to any other field (page 5, lines 1-2).

As broadly recited in claim 9, the invention further features the encoding stage

being operable to encode a slice at a number of quantisation levels, and the quantisation level used being determined within the stage in dependence on the said predetermined number of bits allocated (page 3, lines 19-22).

As broadly recited in claim 10, the invention further features a source of encoded digital video images coupled with a decoder for the encoded images, the decoder having an output coupled as input for said encoding stage (page 3, lines 26-31).

As broadly recited in claim 11, the invention further features the source of encoded digital video images comprising connection means for coupling to a remote source of said images (page 4, lines 1-3).

As broadly recited in claim 12, the invention further features the source of encoded digital video images comprising means for receiving and reading encoded digital video image data from a removable storage device (page 4, lines 3-4).

As broadly recited in claim 13, the invention further features the means for receiving and reading encoded digital video image data from a removable storage device comprising an optical disc reader (page 4, lines 4-8).

As broadly recited in claim 14, the invention further features an optical disc carrying a plurality of video image fields encoded by the method of claim 1 as described above (page 4, lines 9-11).

Grounds of Rejection to be Reviewed on Appeal

The grounds of rejection to be reviewed on Appeal are:

(1) the rejections of claims 1-4 and 6-10 under 35 U.S.C. § 102 over Dieterich U.S. Patent 6,233,278 ("Dieterich");

(2) the rejections of claims 5 and 11-14 under 35 U.S.C. § 103 over Dieterich in view of Kato et al. U.S. Patent 6,535,556 ("Kato")

Arguments

Claims 1-14 Are All Patentable Over Dieterich

The Office Action dated 26 January 2005 rejected claims 1-4 and 6-10 under

35 U.S.C. § 102 over Dieterich.

Applicants respectfully traverse those rejections and submit that claims 1-4 and 6-10 are all patentable over Dieterich for at least the following reasons.

Claim 1

Among other things, the method of claim 1 includes reading data out of an encoder buffer at a bit rate determined at least partially by the fullness of the buffer.

Applicants see no mention of such a feature in Dieterich.

The Office Action cites col. 14, lines 21-42 of Dieterich as supposedly disclosing such a feature.

Applicants respectfully disagree. Reproduced below is the text from Dieterich at col. 14, lines 21-42:

> Per-Stripe Target Success
>
> Some encoders provide bit budget control beyond the frame level, i.e., there are bit budgets for a stripe, a row, or a slice of an image (a stripe may be multiple rows, and a slice is either the same as or a fraction of the length of a row). Accurate bit budget management optimizes coding efficiency while controlling overflow and underflow conditions.
>
> Thus, it would be very advantageous to be able to extract side information that is indicative of bit budget selections for the entire image sequence or portions thereof in advance. The extraction of such bit budget selections side information can be achieved by using an encoder **910** having coding parameter settings that are similar to the encoder **180**. Namely, an image sequence is initially encoded using the encoder **910** in the pre-processing section **110**. This allows the encoder **910** to verify the bit budgeting methods of encoder **180** in advance. Alternatively, one or more encoders **910** in the pre-processing section **110** can be employed to analyze a plurality of bit budgeting methods.
>
> The result from the above analysis by the encoder(s) **910** can be represented as side information in the format of raw data (the number of actual bits used to encode a stripe, a row, or a slice of a particular frame) or as a recommendation to use a particular bit budget for a stripe, a row, or a slice for a particular frame or a choice of bit budgeting method.

Tellingly, the cited text fails to even make any mention whatsoever of an encoder buffer – indeed the word "buffer" does not appear anywhere in the cited text or in the FIG. 9 described by the cited text. Similarly, the cited text does not describe at all how data is read out of an encoder buffer. It certainly does not state or imply that data is read out of an encoder buffer at a bit rate determined at least partially by the fullness of the buffer.

Applicants see no mention of such a feature anywhere else in Dieterich either. Indeed, Applicants do not see any discussion in Dieterich as to how a bit rate at which data is **read out** of an encoder buffer is to be determined.

Therefore, Applicants respectfully submit that Dieterich cannot possibly disclose the method of claim 1.

Also among other things, in the method of claim 1, encoded data for a slice is read into the encoder buffer and subsequently read out therefrom on completion of encoding of the slice.

Applicants see no mention of such a feature in Dieterich.

The Office Action cites col. 14, lines 21-42 of Dieterich as supposedly disclosing such a feature.

Applicants respectfully disagree. As mentioned above, the cited text at col. 14, lines 21-42 of Dieterich does not even mention an encoder buffer, and more particularly does not mention reading any data out of an encoder buffer. So it is not possible that the cited text could disclose that the encoded data for a slice is read out of an encoder buffer on completion of encoding of the slice.

In response to this and other arguments earlier presented, the Examiner states in the Advisory Action dated 20 May 2005:

> "it seems **reasonable** that reading in and out are done at the completion state of a slice and als (sic) Fig. 6, col. 14 lines 21 – 45 shows controlling (rate controller 630) of the encoded data being read in and read out of the buffer (690)."

Advisory Action at page 2, lines 6-8.

Applicants respectfully submit that this statement misunderstands both the law and the teachings of Dieterich.

At the outset, it is irrelevant what seems "reasonable" to the Examiner. M.P.E.P. § 2131 states that:

> "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)."

Thus, the only issue is whether Dieterich discloses, explicitly or inherently, each and every feature of claim 1. The Office Action simply does not cite anything in Dieterich that expressly teaches encoded data for a slice is read out from an encoder buffer on completion of encoding of the slice. Furthermore, there is no allegation that such a feature is somehow inherent in Dieterich, as indeed it is not and could not be.

So for at least this additional reason, Dieterich cannot possibly disclose the method of claim 1.

Additionally, contrary to the Examiner's statement in the Advisory Action, quoted above, FIG. 6 of Dieterich absolutely does **not** show "controlling (rate controller 630) of the encoded data being . . . read out of the buffer (690)." Instead, FIG. 6 only shows the controller 630 controlling a quantization level of quantizer 670 used in encoding date to be **read into** buffer 690. FIG. 6 does not show anything regarding how data is read out of the buffer 690. And as explained above, the cited text the cited text at col. 14, lines 21-42 of Dieterich does not even mention an encoder buffer, and more particularly does not mention reading any data out of an encoder buffer. So it is not possible that the cited text could disclose that the

encoded data for a slice is read out of an encoder buffer on completion of encoding of the slice. Indeed, the cited text at col. 14, lines 21-42 of Dieterich does not even pertain to FIG. 6, but instead very clearly pertains to encoder 910 of FIG. 9.

Accordingly, for at least these reasons, Applicants submit that claim 1 is patentable over Dieterich.

Claims 2-4

Claims 2-4 depend from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1.

Claim 5

Claim 5 depends from claim 1. Even assuming *arguendo* that the Dieterich and Kato references were properly combinable (and the Examiner does not provide any motivation for combining the two references), Applicants respectfully submits that Kato fails to remedy the shortcomings of Dieterich with respect to claim 1 as explained above.

Accordingly, for at least this reason, Applicants respectfully submit that claim 5 is patentable over any combination of Dieterich and Kato.

Claim 6

Among other things, the apparatus of claim 6 includes a buffer coupled to receive encoded field data from the encoding stage and arranged to subsequently output the stored data at a bit rate determined at least partially by the fullness of the buffer.

Applicants see no mention in Dieterich of any buffer including such features.

The Office Action cites col. 14, lines 21-42 of Dieterich as supposedly disclosing such a feature.

Applicants respectfully disagree. As explained above (where the cited text is reproduced in its entirety) with respect to claim 1, the cited text fails to even make any mention whatsoever of a buffer – indeed the word "buffer" does not appear anywhere in the cited text. FIG. 9, which is described by the cited text, does not show any buffer. Similarly, the cited text does not describe at all how data is read out of a buffer. It certainly does not state or imply that a buffer is arranged to output data at a bit rate determined at least partially by the fullness of the buffer.

Applicants see no mention of such a feature anywhere else in Dieterich either. Indeed, Applicants do not see any discussion in Dieterich as to how a bit rate at which data is **read out** of an encoder buffer is to be determined.

Therefore, Applicants respectfully submit that Dieterich cannot possibly disclose the apparatus of claim 6.

Also among other things, in the apparatus of claim 6 the buffer is arranged such that the encoded data for a slice is read in thereto and subsequently read out therefrom on completion of encoding of the slice.

Applicants see no mention of such a feature in Dieterich.

The Examiner cites col. 14, lines 21-42 of Dieterich as supposedly disclosing such a feature.

Applicants respectfully disagree. As mentioned above, the cited text at col. 14, lines 21-42 of Dieterich does not even mention an encoder buffer, and more particularly does not mention reading any data out of an encoder buffer. So it is not possible that the cited text could disclose that the encoded data for a slice is read out of an encoder buffer on completion of encoding of the slice.

In response to this and other arguments earlier presented, the Examiner states in the Advisory Action dated 20 May 2005:

> "it seems **reasonable** that reading in and out are done at the completion state of a slice and als (sic) Fig. 6, col. 14 lines 21 – 45 shows controlling (rate controller 630) of the encoded data being read in and read out of the buffer (690)."

Advisory Action at page 2, lines 6-8.

Applicants respectfully submit that this statement misunderstands both the law and the teachings of Dieterich.

At the outset, it is irrelevant what seems "reasonable" to the Examiner. M.P.E.P. § 2131 states that:

> "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)."

Thus, the only issue is whether Dieterich discloses, explicitly or inherently, each and every feature of claim 6. The Office Action simply does not cite anything in Dieterich that expressly teaches encoded data for a slice is read out from an encoder buffer on completion of encoding of the slice. Furthermore, there is no allegation that such a feature is somehow inherent in Dieterich, as indeed it is not and could not be.

So for at least this additional reason, Dieterich cannot possibly disclose the apparatus of claim 6.

Additionally, contrary to the Examiner's statement in the Advisory Action, quoted above, FIG. 6 of Dieterich absolutely does **not** show "controlling (rate controller 630) of the encoded data being . . . read out of the buffer (690)." Instead, FIG. 6 only shows the controller 630 controlling a quantization level of quantizer 670 used in encoding date to be **read into** buffer 690. FIG. 6 does not show anything regarding how data is read out of the buffer 690. And as explained above, the cited text the cited text at col. 14, lines 21-42 of Dieterich does not even mention an encoder buffer, and more particularly does not mention reading any data out of an encoder buffer. So it is not possible that the cited text could disclose that the encoded data for a slice is read out of an encoder buffer on completion of encoding of the slice. Indeed, the cited text at col. 14, lines 21-42 of Dieterich does not even pertain to FIG. 6, but very clearly instead pertains to encoder 910 of FIG. 9.

Accordingly, for at least these reasons, Applicants submit that claim 6 is patentable over Dieterich.

Claims 7-10

Claims 7-10 depend from claim 6 and are deemed patentable for at least the reasons set forth above with respect to claim 6, and for the following additional reasons.

Claim 10

Among other things, the apparatus of claim 10 includes a source of encoded digital video images coupled with a decoder for said encoded images.

The Examiner states that DWT decoder 712 corresponds to the recited decoder. However, the Examiner fails to indicate where Dieterich supposedly discloses **a source of encoded digital video images** coupled with the decoder. Meanwhile, Applicants respectfully submit that element 706 cannot correspond to the recited source of encoded digital video images, since element 706 must correspond to the separately-recited encoding stage which is coupled to an output of the decoder.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 10 is patentable over Dieterich.

Claims 11-14

Claims 11-14 depend from claim 6. Even assuming *arguendo* that the Dieterich and Kato references were properly combinable (and the Examiner does not provide any motivation for combining the two references), Applicants respectfully submits that Kato fails to remedy the shortcomings of Dieterich with respect to claim 6 as explained above.

Conclusion

For all of the foregoing reasons, Applicants respectfully submits that claims 1-14 are all patentable over the cited prior art. Therefore, Applicants respectfully request that claims 1-14 be allowed and the application be passed to issue.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future filings to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16, 37 C.F.R. § 1.17, or 37 C.F.R. § 41.20, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS & WHITT, P.L.L.C.

Date: 25 July 2005

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Appendix - Claims on Appeal

1. A method for encoding of a digital video image signal in an encoder apparatus having a coding stage and an encoder buffer, the method comprising the steps of:

successively encoding image fields of the signal in compliance with a predetermined coding scheme;

reading the encoded field data into the buffer; and

subsequently reading the stored data out of the buffer at a bit rate determined at least partially by the fullness of the buffer;

wherein each image field is encoded as a series of slices each comprised of a predetermined number of successive lines of the field, with a predetermined number of data bits allocated for the encoding of a slice, and the encoded data for the slice is read into the encoder buffer and subsequently read out therefrom on completion of encoding of the slice.

2. A method as claimed in claim 1, in which the slices of a field are encoded such that the encoded field complies with one or more MPEG standards.

3. A method as claimed in claim 2, in which the slices of a field are intra-coded without reference to any other field.

4. A method as claimed in claim 1, wherein the coding stage is operable to encode a slice at a number of quantisation levels, and the quantisation level used is chosen in dependence on the said predetermined number of bits allocated.

5. A method as claimed in claim 1, wherein each slice comprises sixteen luminance lines.

6. A digital video image signal encoder apparatus comprising:

an encoding stage arranged to receive successive image fields of the signal and encode them according to a predetermined coding scheme; and

a buffer coupled to receive encoded field data from the encoding stage and arranged to subsequently output the stored data at a bit rate determined at least partially by the fullness of the buffer;

wherein the encoding stage is further arranged to encode each image field as a series of slices each comprised of a predetermined number of successive lines of the field and within a predetermined number of data bits allocated for the encoding of a slice, and the buffer is arranged such that the encoded data for the slice is read in thereto and subsequently read out therefrom on completion of encoding of the slice.

7. Apparatus as claimed in claim 6, wherein the encoding stage is arranged to encode the slices of a field such that the encoded field complies with one or more MPEG standards.

8. Apparatus as claimed in claim 7, wherein the encoding stage is arranged to intra-code the slices of a field without reference to any other field.

9. Apparatus as claimed in claim 6, wherein the encoding stage is operable to encode a slice at a number of quantisation levels, and the quantisation level used is determined within the stage in dependence on the said predetermined number of bits allocated.

10. A digital video image processing means comprising an apparatus as claimed in claim 6, further comprising a source of encoded digital video images coupled with a decoder for said encoded images, said decoder having an output coupled as input for said encoding stage.

11. Processing apparatus as claimed in claim 10, wherein said source of encoded digital video images comprises connection means for coupling to a remote source of said images.

12. Processing apparatus as claimed in claim 10, wherein said source of encoded digital video images comprises means for receiving and reading encoded digital video image data from a removable storage device.

13. Processing apparatus as claimed in claim 12, wherein the means for receiving and reading encoded digital video image data from a removable storage device comprises an optical disc reader.

14. An optical disc carrying a plurality of video image fields encoded by the method of claim 1.

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

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ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ____________
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☑ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

The Director is hereby authorized to charge the Appeal Brief fee under 37 CFR 41.20(b)(2) of $500.00 to Deposit Account 50-0238.

The Director is hereby authorized to charge any other fees which may be required, or credit any overpayment to Deposit Account No. 50-0238

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	VOLENTINE FRANCOS & WHITT, P.L.L.C.		
Signature	[signature]		
Printed name	KENNETH D. SPRINGER		
Date	25 July 2005	Reg. No.	39,843

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

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